



Expedition 23-24 Critical Readiness Review

Medical Operations

Presenter

SD/Kathy Pierpoline

Date

02/04/10

HMS Critical Readiness Review:

- **AED (Automated External Defibrillator)**
- **ISS Medical Checklist**
- **Med Kit Redesign**
- **ALSP (Advanced Life Support Pack)**
- **AMP (Ambulatory Medical Pack)**
- **IMAK (ISS Medical Accessory Pack)**



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HMS Critical Readiness Review:

- **HASP (HMS Ancillary Support Pack)**
- **PHS (Periodic Health Status)**
- **PanOptic Digital Ophthalmoscope**
- **IFEP**



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Critical Readiness Review:

- **AED (Automated External Defibrillator)**

- Moved to LAB1O5_D1, extra battery velcroed to locker door
- Resupply all on 39P (8/31/10)

- **Med Kit Redesign**

- Ongoing project
- Scheduled for delivery 43P (April, 2011)





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•ISS Medical Checklist

- Will be updated with Med Kit Redesign
- Consolidate hard copies on orbit to one book
- 2 copies on orbit
- Possibly go to xml for most procedures



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•ALSP (Advanced Life Support Pack)

- Moved to LAB1O5_D1
- Resupplied (piece part) on 19A (ALSP Emergency Surg Pack),
- Resupplied IV fluids – Saline, Dextrose (32P)
- Drug Pack (ULF3)
- EpiPens (3) stowed on inside D1 locker door.





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•AMP (Ambulatory Medical Pack)

- Moved to LAB1O5_D2
- EC8+ Cartridges resupplied (36P, ULF4, 39P)
- Surgical Pack – piece parts on 19A
- Dental Pack - piece parts on 19A
- Pallet 4 (36P)
- Pallet 1 (ULF6)





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•IMAK (ISS Medical Accessory Pack)

- Started sending new Teflon disposable IMAKs (2JA)
- Nomex IMAKs still on orbit
- IMAK 1014 contains extra and resupplied medication (in LAB1O5_D2), HITT has inventory





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•HASP (HMS Ancillary Support Pack)

- Moved to LAB1O5_G2

•PHS (Periodic Health Status)

- PCBA Control Solution Info
 - Received comments from crew
 - BUN consistently low on red (low) controls
 - pH frequently out on red (low) and blue (high) controls
 - Updated procedure to eliminate repeat of control if out of range



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•PanOptic Digital Ophthalmoscope

- Welch Allyn hardware with camera attachment
- Flew on 17A
- Ability to downlink digital photos and video
- Requirements being added to MRID for regular exam





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•IFEP

- No current issues
- Forward Work: CDCA (Common Data Collection Application) software
 - in development for FFQ and IFEP
 - will replace current software on T61p



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Back-Up Slides



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Automated External Defibrillator (AED)

- **Current HW Status**
 - AED successfully activated and checked out in June, 2008
 - Requires monthly inspection (5 minute task)
 - Resupply every 2 years or soonest opportunity if used
 - Procedures updated to reflect AED use
 - Stowed in LAB1O4_D1



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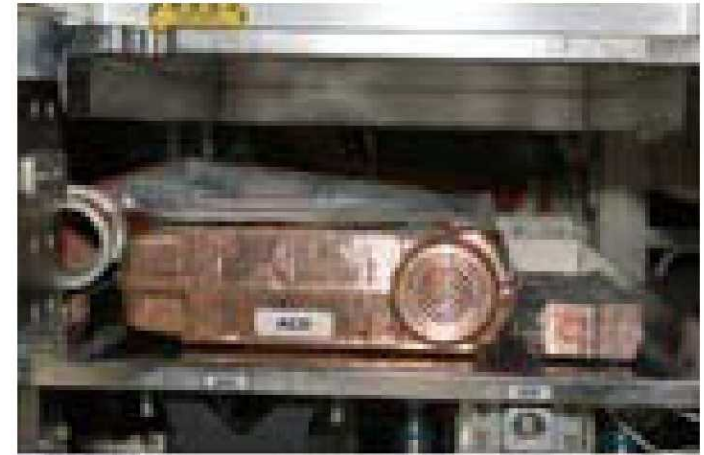
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Automated External Defibrillator (AED)

Functionality:

- ✓ Nominally functions in automated mode—Crewmember simply powers AED on and follows audio/visual prompts
- ✓ Display screen shows cardiac rhythms, shock count, and elapsed time
- ✓ Powered by non-rechargeable battery
- ✓ One AED unit on Station
- ✓ Unit has one prime and one backup battery, 2 sets of electrodes





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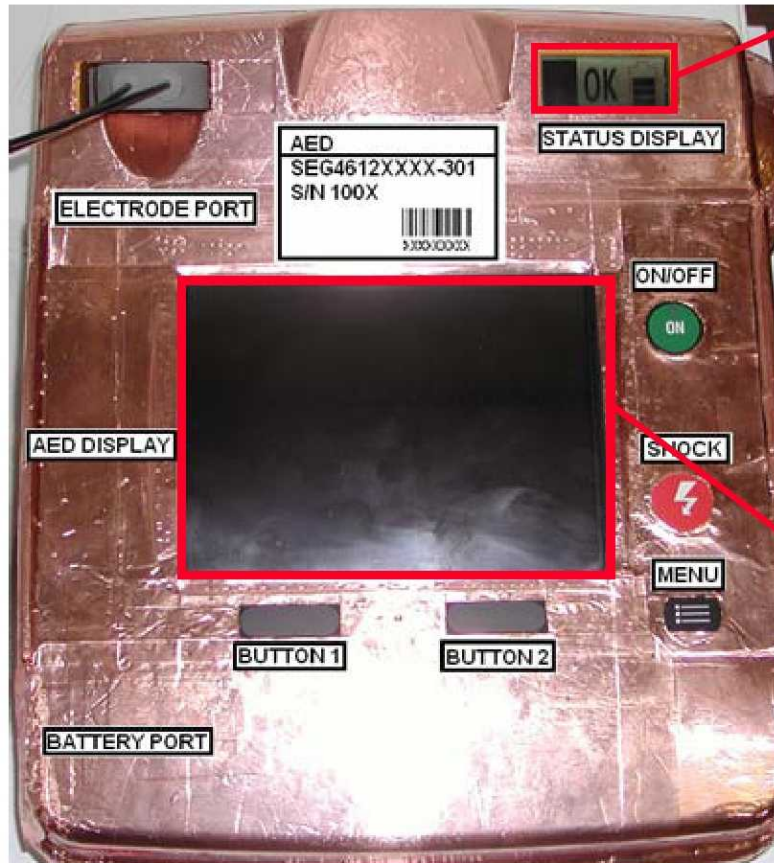
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AED

Maintenance:

Performs daily and monthly self checks and indicates on status display if service required

Data :

No real time data downlink. Data stored in AED – downloaded to a computer upon return. NO MORE COMMANDING!

Provides ECG rhythm, defibrillator incrementor, CPR countdown clock



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02/04/10



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ISS Medical Checklist Planned/Recent Changes

- Incorporated:
 - AED incorporation into emergency procedures.
 - New ACLS flip book sent up on 1J, incorporated with full book revision
- Book Status
 - Hybrid Book
 - Current version flew 1J
 - PCN published after ULF2



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ISS Medical Checklist

Planned/Recent Changes (continued)

- **Recent Changes:**
 - Update with medication change (Mucinex-D substituted for Entex PSE) (30P)
 - CHeCS rack reference updates
 - Ultrasound procedure updates
 - Misc Op Nom changes
- **Future Changes**
 - Med Kit Redesign will require procedure changes
 - Possible elimination of hard copy, change in ACLS Flip Book



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Med Kit Redesign

- CR written and approved for redesign
 - Driven by changes in medication/configuration/availability, carpupject issues
 - System Requirement Review in December, 2009
 - Tentative delivery ULF5
 - Will affect Medical Checklist and Training



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ALSP

- **Current HW Status**
 - ALSP Drug Pack, Airway Pack, and Emergency Surgery Pack flown on 1E
- **Manifest of new HW**
 - Packs are certified to fly on their own to facilitate resupply.
 - Dextrose (0.5 L), NS (0.5 L, 1L) (32P)
 - ALSP IV Admin Pack (32P)
 - ALSP Airway Piece Parts (15A)
 - ALSP Emergency Surgery Piece Parts
 - lidocaine (18S)
 - ALSP Drug Pack - Nitro stat (18S)
- **Timeline Changes/IDRD Req**
 - No updates



•Misc Change

- None



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AMP

- **Current HW Status**
 - Full AMP flown on 13A.1
- **Manifest of new HW**
 - AMP Pallet 1, AMP Pallet 2, and AMP Injectable Pack resupplied (30P) due to expiring medications
 - AMP Pocket 2 resupplied (ULF2)
 - AMP Pallet 4 resupplied (31P)
 - AMP Dental Piece Parts resupplied (15A)
 - AMP Surgical Piece Parts - lidocaine (18S)
- **Timeline Changes/IDRD Req.**
 - No updates





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IMAK

- **Current HW Status**
 - Flown on all Russian and US flights for crew attributable medical items
 - Used as catch-all for resupply
- **New HW or HW Changes**
 - CR submitted to substitute ziplock bags for IMAKs for efficiency, ease of use
- **Manifest of new HW**
 - On each flight, crew request items & some resupply
- **Timeline Changes/IDRD Req.**
 - Added IMAK unpack to 'As Needed' section of Annex 4





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IMAK

- **New HW Design**
 - Size - 12" x 12"
 - Teflon coated for fire retardancy
 - Disposable
 - Opaque for privacy
 - Est STS127/2JA deployment





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HASP

- **Current HW Status**
 - HASP flown on 9A
- **Manifest of new HW**
 - Resupplied NS on 31P (6-1 L, 3-0.5L bags) due to expiration dates
- **Timeline Changes/IDRD Req**
 - No updates



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Current HW Status

- Required hardware included in the AMP Blood Analyzer Pack, AMP Physical Exam Pack, AMP Pallet 3, and ALSP
- EC8 Cartridges resupplied inside IMAK or other container





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Manifest of new HW

- Many changes due to decrease in upmass
- Control Solutions Kit flying on ULF3
- New EC-8 cartridges flying on 33P, 34P
- EC-8 cartridges are sent up in Ziplock, qty = 25, no more use of Nomex container





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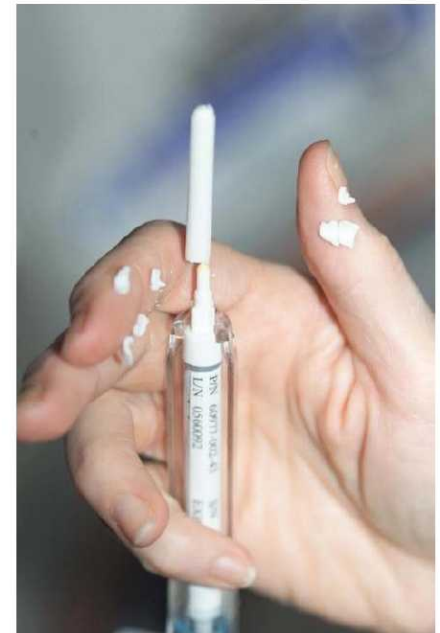
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- **Current Issue – Carpuject Syringe Cap Failure:**
 - Issue
 - » Carpuject cap failed during E16
 - » Needle cap crumbled when carpuject used
 - Action
 - » Procedure written providing instructions for taping needle cap for crew protection for non-emergent events (on IPV Uplink Shelf 12-0520)
 - » All carpujects are resupplied except Rocephin kit
 - » Caps are taped on ground with clear tape





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- **Current Issue – Carpuject Syringe Cap Failure:**
 - » Long Term:
 - Med Kit Redesign ongoing
 - Provide most medications in manufacturer supplied carpujects
 - Supplied without needles – eliminates cap crumbling issues
 - Maintains manufacturer's expiration date
 - Medications not available in carpujects will be supplied in vials
 - Evaluating medication handling system





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HRF Ultrasound

- **Current HW Status**

- Power problems in Increment 16
- Changed drawer location and is now operational
- HRF available for contingency and Payload use
- Moved to COL module
- Working on CMRS certification in COL module



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Validation of On-Orbit Methodology for the Assessment of Cardiac Function and Changes in the Circulating Volume Using Ultrasound and Braslet-M Occlusion Cuffs (SDTO 17011)





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• Overview



– Collaborative effort between
NASA and Russian FSA

- » PI – **J. Michael Duncan MD (NASA)**, V. Bogomolov MD (IBMP)
- » Co-Investigators – I. Alferova (IBMP), S. Dulchavsky MD (Henry Ford Health System, Detroit), **D. Ebert PhD (Wyle)**, **D. Hamilton MD, PhD (Wyle)**, V. Matveev MD (GCTC), **A. Sargsyan MD (Wyle)**



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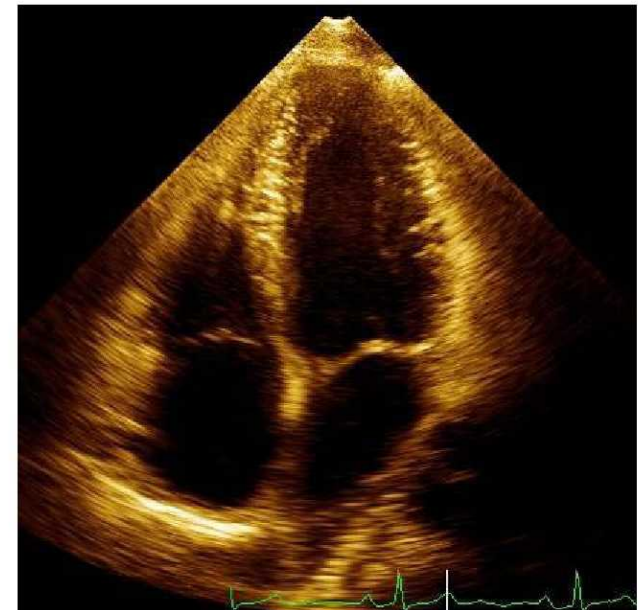
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- **Overview (continued)**
 - Utilizes HRF Ultrasound and current Russian countermeasures (Braslet-M cuffs)
 - Zero Upmass experiment
 - Applicable Increments
 - » Increment 16 (5 scans)
 - » Increment 18 (5 scans)
 - » Increment 19 (requesting 2 paired scans)





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- **Overview (continued)**
 - **Increment 19/20 Braslet Study**
 - » Want to conduct 2 pair of scans in Incr 19/20
 - » M. Barratt, T. Kopra, K. Wakata, G. Padalka





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- **Objectives**

- Develop and validate methodology to assess circulating volume changes and cardiac function in spaceflight conditions, through short term hemodynamic modification using Braslet-M occlusion cuffs
- Tests the performance of occlusion cuffs in modifying fluid shift, including physiological measurements of Braslet cuff use





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- **Benefit/Rationale**

- Augments the capability of the onboard ultrasound system, including
 - » A newly validated operating mode
 - » Adds methodologies available
 - » Hones telemedicine experience
- Increased understanding of the Braslet countermeasures





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• Resources

- Crew Time (nominal)
 - » Set-up – 55 minutes
 - » Prep – 5 minutes
 - » Scan – 60 minutes total
 - Operator and Subject
 - Scan – 25 minutes
 - Apply Braslet (Subject) – wait at least 10 minutes
 - Scan – 25 minutes
 - Cardiac, femoral vein, jugular scans
 - Valsalva and Mueller maneuvers
 - » Stow – 20 minutes



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• Resources (continued)

– Ground Time

» Before Scan

- HRF – Rack Power-up commanding (≤ 90 minutes before scan)
- Marshall – Activation commanding (≤ 90 minutes before scan)
- PI team Preparation
- MPSR/BME Console support

» After scan

- HRF – Downlink commanding (≤ 2 hours)
- TSC – provide videos to PI team
- Marshall – Deactivation command (≤ 2 hours)
- BME – Still photo download, MDRF for video if necessary





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- **Resources (continued)**

- Hardware

- » Ultrasound system (part of HRF)
 - » Braslet-M cuffs
 - » Ultrasound gel
 - » Straw
 - » Cameras – PD 100/G1 and DCS 760/D2X (video and still image)





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• Scheduling Constraints

- No exercise within 2 hrs of scan session
- No Braslet use within 24 hrs of scan session
- No caffeine 12 hrs prior to scan session
- No heavy meals 4 hrs prior to scan session
- No food at all 2 hrs prior to scan session
- Acoustic Constraint – 4 hours





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Questions?